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ABSTRACT

This study was undertaken to examine the relationship between self-reported and pre-post measures of academic growth. Self-reported and pre-post measures were obtained in three areas, simple cognitive, complex cognitive and attitudinal. The subjects were 162 graduate students enrolled in six different graduate courses. Partial correlations relating self-reported measures of growth to post test performance on measures of achievement (simple and complex cognitive) and attitude, controlling for pre-test performance, indicated that self-reported measures of academic growth were primarily related to growth in attitudes toward the subject matter of a course. (Author)

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A STUDY OF THE VALIDITY OF SELF-REPORTED MEASURES OF ACADEMIC GROWTH

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The typical course evaluation questionnaire solicits student ratings of such factors as instructor performance and course content. As such, they serve as a process evaluation of what transpired in the classroom. Recently, Hogan and Hartley (1972) have suggested that student ratings of their development or change be incorporated into evaluation questionnaires. This approach to the evaluation of courses and instruction has been seen as a means whereby the focus of the evaluation could be changed to reflect the outcomes of instruction.

The purpose of this study was to relate measures of student self-reported academic growth, as measured by a scale similar to Hogan and Hartley's, to indices of student development derived from pre and post test measures of cognitive and affective variables related to the content of instruction. Measures of self-reported and observed growth were obtained in three domains of academic behavior, 1. simple cognitive, 2. complex cognitive, and 3. affective.

Previous research indicated that self-report methods of assessing cognitive variables, such as intelligence or academic ability, are positively related to observed measures of the same variables. Berdie (1971), in a study using college students, observed correlations between self-claimed and tested knowledge of famous people in politics, the arts, and history, ranging from .47 to .74. Bowen (1968) examined the relationship between self-estimates of academic ability and academic performance on a sample of 389 high school students. He found that self-estimates of the ability to do

school work correlated .64 with high school grade point average. Bowen also found self-estimates of academic ability to be related to composite scores on the Differential Aptitude Test Battery (r=.51).

A number of self-report personality and interest inventories contain scales which are keyed against measures of cognitive ability. For example, the Intellectual Efficiency (Ie) scale from the California Personality Inventory (Gough, 1957) was found to correlate positively with the Terman Concept Mastery Test (r=.58), which is a measure of general intelligence. A correlation of .50 was also observed between Ie and the Kulman-Anderson Intelligence Test.

Self-report measures have also been found to be useful in assessing affective variables. Hamilton (1971) found that simple one item self-ratings of self-esteem, dominance and open-mindedness perform as well as other methods of measurement, such as peer nominations and emperically derived scales, in terms of their convergent and discriminant validity. In a similar study, Wetzel (1963) related simple one item self-ratings of adjustment and extroversion to two second order factor scores derived from Cattell's 16PF which were labeled "dynamic integration" and "introversion-extroversion." Self-ratings of adjustment correlated .56 with the dynamic integration factor score, and ratings of extroversion correlated .66 with the introversion-extroversion factor score.

METHOD

Subjects

The subjects for this study were 162 graduate students enrolled in six different sections of three different statistics courses taught in the College of Education at Southern Illinois University at Carbondale. The three courses were, 1. an introductory statistics course, 2. an experimental design course, and 3. a research design course emphasizing the use of the general linear regression model.

Measures

Cognitive Domain. Objective tests were developed based on the content of each course, a separate test being developed for each course. Items included in the tests were taken from a number of sources such as the instructor's manual for the text, and items from exams developed and used previously by the instructor sample. Some items were developed specifically for the purposes of this study. Each instructor reviewed the items and only those items which were considered to be measuring content that was actually presented were retained. Two kinds of items were developed for each exam. One type consisted of items intended to measure simple cognitive outcomes, such as symbol recognition and definition of terms. The format used for these simple cognitive items was a series of matching exercises. The second type of items were intended to assess more complex skills such as analysis and problem solving. In this section of each exam, multiple choice item formats were used. Total scores on each of these sections were considered respectively to be measures of simple and complex cognitive achievement. Another measure

of student achievement was obtained by using the scores each student received in classroom exams. When more than one exam was given, the individual exams were standardized and summed to obtain a composite index of student achievement on class exams.

Affective Domain. A measure of the affective orientation toward the content of each course was obtained by using an eleven item semantic differential scale on which the students rated the subject matter of the course. The items were composed of bipolar adjectives that loaded high on the evaluation factor described by Osgood et al. (1957).

Self Reported Growth. Measures of self-reported growth were obtained by having the subjects rate, on a five point scale, the degree of growth they felt they had realized as a result of taking the course. The subjects were asked to rate their growth by responding to eleven items that described various educational outcomes in the cognitive and affective domains. The items on the self-reported growth scale described educational outcomes which paralleled the Taxonomy of Educational Objectives (Bloom, et al., 1971). Four items related to growth in performance on objectives ranging from knowledge to application were combined into a scale to measure self-reported simple cognitive growth. Three items relating to objectives ranging from analysis to evaluation were combined into a scale to measure self-reported complex cognitive growth. Four items relating attitudes toward and valuing of the subject matter were combined into a scale to measure self-reported affective growth.

Procedures. Early in the quarter pre tests were administered with the achievement tests and the semantic differential attitude scale. During the last week of the quarter, post-tests were administered with these same

scales. The self-reported growth scales were also administered during the post testing session. Approximately ten weeks separated the pre and post testing sessions.

Missing Data. Out of the original sample of 162 subjects, 133 generated sufficient data for the final analysis. Fifteen subjects withdrew from the courses, eight failed to complete the test battery, or filled out the answer sheets improperly, and six persons did not attend class at the time of the post test.

Statistical Treatment of Growth Data. In keeping with the position taken by O'Connor (1972), the relationship between self-reported growth and pre-post growth was expressed in terms of a partial correlation coefficient. Each self-report measure was correlated with the appropriate post test measure of performance, with the corresponding pre test measure being statistically held constant. The obtained partial correlations were then tested to determine if they were significantly greater than zero ($\alpha = .05$). A one tailed alternative was used since the review of literature suggested that positive relationships would be observed.

RESULTS

Table 1 contains the partial correlations between each of the self-report measures and post test performance, controlling for pre test performance. The first row in Table 1 presents the partial r's for simple cognitive growth, and they represent the correlation between self-reported simple cognitive growth and post test simple cognitive achievement. With the exception of class 2 the correlations are small and positive.

The pooled within class partial r was significantly greater than zero, but when class 2 was removed from the analyses, the pooled within partial r reduced to .14 (not significant).

The second row in Table 1 contains the partial r's for complex cognitive growth. They represent the correlation between self-reported complex cognitive growth and post test performance on the complex cognitive achievement test, controlling for pre test performance on the same exam. None of the within class correlations were significant, nor was the pooled within class partial r significantly greater than zero.

The coefficients in the third row of Table 1 are the partial r's relating self-reported growth in attitudes to post test attitude score, controlling for pre test attitude score. The partial r's were significantly greater than zero in each class.

The last row of coefficients in Table 1 are the partial r's relating self-reported cognitive growth (simple and complex combined) and performance on class exams. Pre test composite performance on the simple and complex cognitive achievement tests was partialed out. When more than one class exam was given, the scores on each exam were standardized and summed to obtain a composite index of achievement on class exams. The partial r for class 4 and the pooled within class partial r were significantly greater than zero.

INSERT TABLE 1 HERE

DISCUSSION

These results suggest that self-report measures of academic growth are primarily sensitive to growth in student's affective orientation toward the subject matter of the course. While positive correlations were observed between self-reported and pre-post measures of cognitive growth, they tended to be low. Consequently, evaluators using student ratings of cognitive growth should be encouraged to also collect pre-post performance data relative to the objectives of the course, since these two measures of growth (self-reported and pre-post) are relatively independent.

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TABLE 1

Partial Correlations between Self-Reported Growth
and Post Test Performance, Controlling for Pre Test Performance
for Each Class

	Class *						
Domain of Performance	1 N=42	2 N=20	3 N=17	4 N=13	5 N=25	6 N=16	Pooled Within Class Partial r's
Simple Cognitive	.10	.54**	.10	.21	.24	.07	.21**
Complex Cognitive	.08	.11	.07	.07	.30	-.26	.10
Affective	.54**	.55**	.52**	.59**	.55**	.67**	.55**
Class Exams	.11	.26	.30	.48**	.17	.38	.25**

* Classes 1 and 2 were the introductory statistics classes; Classes 3 and 4 were the experimental design classes, and Classes 5 and 6 were the regression analysis classes.

** Correlations significantly greater than zero (α =.05, one-tailed)